JC09 Rec'd PCT/PTO 19 MAR 2001
09/787514

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
REQUEST FOR FILING NATIONAL PHASE OF
PCT APPLICATION UNDER 35 U.S.C. 371 AND 37 CFR 1.494 OR 1.495

To: Hon. Commissioner of Patents
Washington, D.C. 20231

00909

TRANSMITTAL LETTER TO THE UNITED STATES DESIGNATED/ELECTED OFFICE (DO/EO/US)

Atty Dkt: P 277904 /2990403US
M# /Client Ref.

From: Pillsbury Winthrop LLP, IP Group:

Date: March 19, 2001

This is a **REQUEST** for **FILING** a PCT/USA National Phase Application based on:

1. International Application	2. International Filing Date	3. Earliest Priority Date Claimed
PCT/FI00/00653	18 July 2000	19 July 1999
⇧ country code	Day MONTH Year	Day MONTH Year (use item 2 if no earlier priority)

4. Measured from the earliest priority date in item 3, this PCT/USA National Phase Application Request is being filed within:

(a) ☒ 20 months from above item 3 date (b) ☐ 30 months from above item 3 date,

(c) Therefore, the due date (unextendable) is March 19, 2001

5. Title of Invention METHOD OF BILLING SUBSCRIBERS IN TELECOMMUNICATIONS NETWORK

6. Inventor(s) JOKINEN, Vesa-Matti

Applicant herewith submits the following under 35 U.S.C. 371 to effect filing:

7. ☒ Please immediately start national examination procedures (35 U.S.C. 371 (f)).

8. ☒ **A copy of the International Application** as filed (35 U.S.C. 371(c)(2)) is transmitted herewith (file if in English but, if in foreign language, file only if not transmitted to PTO by the International Bureau) including:

a. ☒ Request;
b. ☒ Abstract;
c. 11 pgs. Spec. and Claims;
d. 3 sheet(s) Drawing which are ☐ informal ☒ formal of size ☒ A4 ☐ 11"

9. ☒ **A copy of the International Application has been transmitted by the International Bureau.**

10. **A translation of the International Application** into English (35 U.S.C. 371(c)(2))
a. ☐ is transmitted herewith including: (1) ☐ Request; (2) ☐ Abstract;
(3) _____ pgs. Spec. and Claims;
(4) _____ sheet(s) Drawing which are:
☐ informal ☐ formal of size ☐ A4 ☐ 11"
b. ☒ is not required, as the application was filed in English.
c. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.
d. ☐ Translation verification attached (not required now).

RE: USA National Filing of PCT /FI00/00653

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11. ☒ **PLEASE AMEND** the specification before its first line by inserting as a separate paragraph:
a. ☒ --This application is the national phase of international application PCT/FI00/00653 filed 18 July 2000 which designated the U.S.--
b. ☐ --This application also claims the benefit of U.S. Provisional Application No. 60/ _____, filed _____ .--

12. ☐ Amendments to the claims of the International Application **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., before 18th month from first priority date above in item 3, are transmitted herewith (file only if in English) including:**

13. ☒ PCT Article 19 claim amendments (if any) have been transmitted by the International Bureau

14. ☐ Translation of the amendments to the claims **under PCT Article 19 (35 U.S.C. 371(c)(3)), i.e., of claim amendments** made before 18th month, **is attached (required by 20th month from the date in item 3 if box 4(a) above is X'd, or 30th month if box 4(b) is X'd, or else amendments will be considered canceled).**

15. **A declaration of the inventor** (35 U.S.C. 371(c)(4))
a. ☒ is submitted herewith ☒ Original ☐ Facsimile/Copy
b. ☐ is not herewith, but will be filed when required by the forthcoming PTO Missing Requirements Notice per Rule 494(c) if box 4(a) is X'd or Rule 495(c) if box 4(b) is X'd.

16. **An International Search Report (ISR):**
a. Was prepared by ☐ European Patent Office ☐ Japanese Patent Office ☒ Other
b. ☒ has been transmitted by the international Bureau to PTO.
c. ☐ copy herewith (___ pg(s).) ☐ plus Annex of family members (___ pg(s).).

17. **International Preliminary Examination Report** (IPER):
a. ☒ has been transmitted (if this letter is filed after 28 months from date in item 3) in English by the International Bureau with Annexes (if any) in original language.
b. ☐ copy herewith in English.
c.1 ☐ IPER Annex(es) in original language ("Annexes" are amendments made to claims/spec/drawings during Examination) including attached amended:
c.2 ☐ Specification/claim pages #_____ claims #_____ Dwg Sheets #_____
d. ☐ Translation of Annex(es) to IPER **(required by 30th month due date, or else annexed amendments will be considered canceled).**

18. **Information Disclosure Statement** including:
a. ☒ Attached Form PTO-1449 listing documents
b. ☒ Attached copies of documents listed on Form PTO-1449
c. ☒ A concise explanation of relevance of ISR references is given in the ISR.

19. ☒ **Assignment** document and Cover Sheet for recording are attached. Please mail the recorded assignment document back to the person whose signature, name and address appear at the end of this letter.

20. ☐ Copy of Power to IA agent.

21. ☐ **Drawings** (complete only if 8d or 10a(4) not completed): ___ sheet(s) per set: ☐ 1 set informal; ☐ Formal of size ☐ A4 ☐ 11"

22. Small Entity Status ⌀ ☒ is **Not** claimed ☐ is claimed (**pre**-filing confirmation required)
22(a) _____ (No.) Small Entity Statement(s) enclosed (since 9/8/00 Small Entity Statements(s) not essential to make claim)

23. **Priority** is hereby claimed under 35 U.S.C. 119/365 based on the priority claim and the certified copy, both filed in the International Application during the international stage based on the filing in (country) Finland of:

	Application No.	Filing Date		Application No.	Filing Date
(1)	991624	19 July 1999	(2)		
(3)			(4)		
(5)			(6)		

a. ☒ See Form PCT/IB/304 sent to US/DO with copy of priority documents. If copy has not been received, please proceed promptly to obtain same from the IB.
b. ☐ Copy of Form PCT/IB/304 attached.

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24. Attached:

25. **Preliminary Amendment:** See Attached

25.5 Per Item 17.c2, **cancel original** pages #_____, claims #_____, Drawing Sheets #_____

26. **Calculation of the U.S. National Fee (35 U.S.C. 371 (c)(1)) and other fees is as follows:**
Based on amended claim(s) per above item(s) ☐ 12, ☐ 14, ☐ 17, ☐ 25, ☐ 25.5 (hilite)

Total Effective Claims	17	minus 20 =	0	x $18/$9	= $0	966/967
Independent Claims	2	minus 3 =	0	x $80/$40	= $0	964/965
If any proper (ignore improper) Multiple Dependent claim is present,				add$270/$135	+0	968/969

BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(4)): →→ **BASIC FEE REQUIRED, NOW** →→→→

A. If country code letters in item 1 are **not** "US","BR","BB","TT","MX","IL" "NZ", "IN" or "ZA"

See item 16 re:

1.	Search Report was not prepared by EPO or JPO	add$1000/$500		960/961
2.	Search Report was prepared by EPO or JPO	add$860/$430	+1000	970/971

SKIP B, C, D AND E UNLESS country code letters in item 1 are "US","BR","BB","TT","MX","IL", "NZ", "IN" or "ZA"

→ (X) ☐	B. If USPTO did not issue both International Search Report (ISR) and (if box 4(b) above is X'd) the International Examination Report (IPER),	add$970/$485	+0	960/961
(only) (one) → (of) ☐	C. If USPTO issued ISR but not IPER (or box 4(a) above is X'd),	add$710/$355	+0	958/959
(these) (4) → (boxes) ☐	D. If USPTO issued IPER but IPER Sec. V boxes not all 3 YES,	add$690/$345	+0	956/957
→ ☐	E. If international preliminary examination fee was paid to USPTO and Rules 492(a)(4) and 496(b) satisfied (IPER Sec. V all 3 boxes YES for all claims),	add $100/$50	+0	962/963

27. **SUBTOTAL =** $1000

28. If Assignment box 19 above is X'd, add Assignment Recording fee of ----$40 +40 (581)

29. Attached is a check to cover the ---------- **TOTAL FEES** $1040

Our Deposit Account No. 03-3975
Our Order No. 60258 (C#) | 277904 (M#)

00909

CHARGE STATEMENT: The Commissioner is hereby authorized to charge any fee specifically authorized hereafter, or any missing or insufficient fee(s) filed, or asserted to be filed, or which should have been filed herewith or concerning any paper filed hereafter, and which may be required under Rules 16-18 and 492 (missing or insufficient fee only) now or hereafter relative to this application and the resulting Official document under Rule 20, or credit any overpayment, to our Account/Order Nos. shown above for which purpose a duplicate copy of this sheet is attached.
This CHARGE STATEMENT does not authorize charge of the issue fee until/unless an issue fee transmittal form is filed

Pillsbury Winthrop LLP
Intellectual Property Group

By Atty: Christine H. McCarthy **Reg. No.** 41844

Sig: _____ **Fax:** (202) 822-0944
Tel: (202) 861-3075

Atty/Sec: CHM/srd

NOTE: File in duplicate with 2 postcard receipts (PAT-103) & attachments.

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IN THE UNITES STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF	Confirmation No.:
JOKINEN et al.	Group Art Unit:
Appln. No.:	Examiner:
Filed:	

Title: METHOD OF BILLING SUBSCRIBERS IN TELECOMMUNICATION NETWORK

March 19, 2001

* * * * *

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
Washington, D.C. 20231

Sir:

Kindly preliminary amend the above-referenced application as follows:

IN THE TITLE:

Please delete the present title and replace it with the following new title:

METHOD AND SYSTEM FOR BILLING SUBSCRIBERS IN A TELECOMMUNICATION NETWORK

IN THE CLAIMS:

Please enter the following amended claims:

1. (*Amended*) A method of billing subscribers in a telecommunication network, wherein each subscriber has billing accounts that are charged when services of the telecommunication network are used, the method comprising:

forming at least one subscriber billing group having at least two subscribers;

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JC10 Rec'd PCT/PTO 19 MAR 2001

IN THE UNITES STATES PATENT AND TRADEMARK OFFICE

In re PATENT APPLICATION OF

JOKINEN et al.

Appln. No.:

Filed:

Confirmation No.:

Group Art Unit:

Examiner:

Title: METHOD OF BILLING SUBSCRIBERS IN TELECOMMUNICATION NETWORK

March 19, 2001

* * * * *

PRELIMINARY AMENDMENT

Hon. Commissioner of Patents
Washington, D.C. 20231

Sir:

Kindly preliminary amend the above-referenced application as follows:

IN THE TITLE:

Please delete the present title and replace it with the following new title:

METHOD AND SYSTEM FOR BILLING SUBSCRIBERS IN A TELECOMMUNICATION NETWORK

IN THE CLAIMS:

Please enter the following amended claims:

1. (*Amended*) A method of billing subscribers in a telecommunication network, wherein each subscriber has billing accounts that are charged when services of the telecommunication network are used, the method comprising:

forming at least one subscriber billing group having at least two subscribers;

assigning each subscriber a billing account in a billing database; and

determining at least one subscriber in each group as a master subscriber, the master subscriber having access rights to the billing database and carrying out predetermined procedures in and between the accounts of the subscriber billing group.

2. (*Amended*) A method as claimed in claim 1, wherein the master subscriber has access rights to the billing database through the telecommunication network.

3. (*Amended*) A method as claimed in claim 1, wherein the master subscriber carries out balance transfers between the billing accounts within the group.

4. (*Amended*) A method as claimed in claim 1, wherein each the billing account has a limited balance, and the master subscriber changes the balance limit or balance of the billing account.

5. (*Amended*) A method as claimed in claim 4, wherein each the billing account is a prepayment account and/or an account equipped with a credit limit.

6. (*Amended*) A method as claimed in claim 5, wherein the credit limit is obtained from the balance of the master subscriber.

7. (*Amended*) A system for billing a plurality of telecommunication network subscribers wherein each subscriber has billing accounts in a billing database that are charged when services of a telecommunication network are used, the system comprising:

a subscriber database having at least one subscriber billing group including at least two subscribers, each subscriber having a billing account in the billing database, and at least one subscriber in each group is a master subscriber,

wherein the master subscriber having access rights to the billing database and carries out predetermined procedures in and between the accounts of the subscriber billing group, and

a telecommunication server connected to the subscriber database, the master subscriber connecting through the telecommunication network to the server to carry out the predetermined procedures in the billing database.

8. (*Amended*) A system as claimed in claim 7, wherein the master subscriber has access rights to the billing database through the telecommunication network.

9. (*Amended*) A system as claimed in claim 7, wherein the predetermined procedures include balance transfers between the billing accounts within each the group.

10. (*Amended*) A system as claimed in claim 7, wherein each the billing account has a limited balance, and the predetermined procedures include changing the balance limit or balance of the billing account.

11. (*Amended*) A system as claimed in claim 10, wherein the billing account is a prepayment account and/or an account equipped with a credit limit.

12. (*Amended*) A system as claimed in claim 11, wherein the credit limit is obtained from the balance of the master subscriber.

13. (*Amended*) A system as claimed in claim 7, wherein the master subscriber accesses the telecommunication service by making a facility call to a predetermined service number.

14. (*Amended*) A system as claimed in claim 13, wherein the telecommunication server includes an automatic answering apparatus.

15. (*Amended*) A system as claimed in claim 7, wherein the telecommunication server is a World Wide Web (WWW) server.

16. (*Amended*) A system as claimed in claim 7, wherein the telecommunication server is a Wireless Application Protocol (WAP) server.

17. (*Amended*) A system as claimed in claim 7, wherein the telecommunication server is a short message centre or a short message server.

See the attached Appendix for the changes made to effect the above claims.

REMARKS

Claims 1-17 are pending. By this preliminary amendment, Claims 1-17 have been amended (total number of claims 17). Claims 1 and 7 are independent claims.

The claims are amended herein for the purpose of grammatical clarity.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached Appendix is captioned "Version with markings **to show changes made"**.

Early and favorable action on the merits are respectfully requested.

Respectfully submitted,

Pillsbury Winthrop, LLP

By: _____

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Enclosure: Appendix

APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title is changed as follows:

METHOD [OF] AND SYSTEM FOR BILLING SUBSCRIBERS IN A TELECOMMUNICATION NETWORK

IN THE CLAIMS:

1. (*Amended*) A method of billing subscribers in a telecommunication network, wherein each subscriber has billing accounts that are charged when services of the telecommunication network are used, **[c h a r a c t e r i z e d** by] the method comprising:

forming at least one subscriber billing group [(G1, G2) comprising] having at least two [or more] subscribers [(MS1...MS6),];

assigning each subscriber [having] a billing account [of his or her own] in a billing database; [and]

determining at least one subscriber in [the] each billing group [(G1, G2)] as a master subscriber [(MS1)], [who has a right] the master subscriber having access rights to [access said] the billing database; and

[carry] carrying out predetermined procedures in and between the accounts of the subscriber billing group.

2. (*Amended*) A method as claimed in claim 1, **[c h a r a c t e r i z e d** in that] wherein the master subscriber [(MS1)] has [the right] access rights to [access said] the billing database through [said] the telecommunication network.

3. (*Amended*) A method as claimed in claim 1, **[c h a r a c t e r i z e d** in that] wherein the master subscriber [(MS1)] carries out balance transfers between the billing accounts within [said] the group [(G1, G2)].

4. (*Amended*) A method as claimed in [any one of claims] claim 1 [to 3], **[c h a r a c t e r i z e d** in that said] wherein each the billing account has a limited balance, and the master subscriber [(MS1)] changes the balance limit or balance of the billing account.

5. (*Amended*) A method as claimed in claim 4, **[c h a r a c t e r i z e d** in that said] wherein each billing account is a prepayment account and/or an account equipped with a credit limit.

6. (*Amended*) A method as claimed in claim 5, **[c h a r a c t e r i z e d** in that] wherein the credit limit is obtained from the balance of the master subscriber.

7. (*Amended*) A system for billing a plurality of telecommunication network subscribers wherein each subscriber has billing accounts in a billing database [(10)] that are charged when services of a telecommunication network are used, **[c h a r a c t e r i z e d** in that] the system comprising:

a subscriber database having at least one subscriber billing group [(G1, G2) comprising] including at least two [or more] subscribers [(MS1...MS6) is formed in a subscriber database (2-2)], each subscriber having a billing account [of his or her

own] in the billing database [(10)], and at least one subscriber in [the] each billing group is a master subscriber [(MS1)],

[who has a right] wherein the master subscriber has access rights to [access said] the billing database [(10)] and [carry] carries out predetermined procedures in and between the accounts of the subscriber billing group[, and in that];

wherein a telecommunication server is connected to the subscriber database, [(2-2) through which server] the master subscriber [(MS1) establishes a connection] connecting through [said] the telecommunication network [in order] to the telecommunication server to carry out [said facilities] the predetermined procedures in the billing database [(10)].

8. (*Amended*) A system as claimed in claim 7, [**c h a r a c t e r i z e d** in that] wherein the master subscriber [(MS1)] has [the right] access rights to [access said] the billing database through [said] the telecommunication network.

9. (*Amended*) A system as claimed in claim 7 [or 8], [**c h a r a c t e r i z e d** in that said facilities comprise a balance transfer] wherein the predetermined procedures include transferring balances between the billing accounts within [said] each billing group.

10. (*Amended*) A system as claimed in [any one of claims 7 to 9, **c h a r a c t e r i z e d** in that said] claim 7, wherein each billing account has a limited balance, and [said facilities comprise] the predetermined procedures include changing the balance limit or balance of the billing account.

11. (*Amended*) A system as claimed in claim 10, [**c h a r a c t e r i z e d** in that said] wherein the billing account is a prepayment account and/or an account equipped with a credit limit.

12. (*Amended*) A system as claimed in claim 11, [**c h a r a c t e r i z e d** in that] wherein the credit limit is obtained from the balance of the master subscriber.

13. (*Amended*) A system as claimed in [any one of claims 7 to 12, **c h a r a c t e r i z e d** in that] claim 7, wherein the master subscriber [(MS1) has access to said] accesses the telecommunication service by making a facility call to a predetermined service number.

14. (*Amended*) A system as claimed in claim 13, [**c h a r a c t e r i z e d** in that said] wherein the telecommunication server [is] includes an automatic answering apparatus.

15. (*Amended*) A system as claimed in [any one of claims 7 to 12, **c h a r a c t e r i z e d** in that said] claim 7, wherein the telecommunication server is a World Wide Web (WWW) server.

16. (*Amended*) A system as claimed in [any one of claims 7 to 12, **c h a r a c t e r i z e d** in that said] claim 7, wherein the telecommunication server is a Wireless Application Protocol (WAP) server.

17. (*Amended*) A system as claimed in [any one of claims 7 to 12, characterized in that said] claim 7, wherein the telecommunication server is a short message centre or a short message server.

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METHOD OF BILLING SUBSCRIBERS IN TELECOMMUNICATION NETWORK

FIELD OF THE INVENTION

The invention relates to billing subscribers in a telecommunication network.

BACKGROUND OF THE INVENTION

Telecommunication networks provide subscribers with various telecommunication services for which a network operator or a service provider bills the subscriber to a service or the user of a network connection. The most common telecommunication service is a speech call or a data call, for which the user is charged based on the duration of a call, for example, according to a given call tariff. Conventionally, call charges over a certain billing period are collected together and the subscriber or the owner of the network connections is billed afterwards. However, tariffs and charges for mobile calls, international calls and various special services may be quite high, which may result in unexpectedly high call charges over a billing period. In order to avoid unpleasant surprises, some subscribers wish to set a maximum limit to charges for calls made during a given period by themselves, members of their family or their employees. This can be implemented such that, for example, when the accumulated charges of a certain subscriber or subscriber group reach a given limit, the subscriber is prevented from using the network or services, and thus causing more charges.

In some telecommunication systems, the subscriber may prepay all his or her telecommunication services. In such a case, the subscriber can use the services only if he or she has a positive prepaid balance; when the prepaid balance becomes zero or when it is too low for the requested service, no service will be provided. In the present application, subscribers who are charged based on prepayment or a certain credit limit are called balance-limited subscribers. Balance limits are set by using contracts between the subscriber (or the owner of the connection) and the network operator or service provider through the service point of the network operator. If, for example, those who are responsible for the expenditures (e.g. parents) have provided other subscribers (e.g. children) with a certain prepaid balance per month and the balance has been exhausted before the proper time and those who are responsible have wished to increase available operation time (to enable a child to make calls after the previously agreed balance is overdrawn), they

have been compelled to carry out this function through the service point of the network operator, which has not only been difficult for the subscriber but also required administrative work from the operator, thus causing delay.

BRIEF DESCRIPTION OF THE INVENTION

An objective of the invention is to provide a simpler and more flexible way to manage subscriber billing in telecommunication networks.

This and other objectives of the invention are achieved by the invention defined in the accompanying independent claims. Preferred embodiments of the invention are disclosed in the dependent claims.

According to a basic idea of the invention, at least one subscriber billing group is formed which comprises two or more subscribers (family members or employees of a small-sized enterprise, for example). Each subscriber has a billing account of his or her own in a billing database of the network operator (or service provider). The billing account of each subscriber is charged in a usual manner when the subscriber uses the services of the telecommunication network. At least one subscriber in the group is specified as a master subscriber, who has a right to carry out predetermined procedures in and between the accounts of said billing group in said billing database through said telecommunication network. The procedures include transferring a prepaid balance from an account to another, changing the billing limit, transferring a bill or a billing right between different subscribers, etc. The subscribers in the subscriber group may also have different rights, for example such that some of the subscribers have a right to check the balance only within the group while some have a right to check their personal balance only. An advantage of the invention is that the master subscriber may quickly and easily carry out a desired balance facility; for example, he or she may change the prepaid balance within the subscriber group directly from his or her terminal without the intervention of the manned service point and the related administrative work of the operator. The master subscriber may carry out the functions by utilizing any suitable telecommunication service, such as a facility call, short message service or Internet service, e.g. WAP (Wireless Application Protocol). A facility call refers to a call to a predetermined number, wherein a predetermined procedure (e.g. voice frequency key selection) is carried out. User help announcements may readily be included in the facility calls.

The rights of the master subscriber can be identified based on the unique authentication or subscriber data of the telecommunication network or the connection protocol used or a separate authentication procedure, such as a PIN (Personal Identification Number) in the facility call.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is now described in closer detail in connection with the preferred embodiments and with reference to the accompanying drawings, in which

Figure 1 shows different embodiments of a mobile station being connected to a server of an operator,

Figure 2 shows a subscriber database, and

Figure 3 is a flow diagram illustrating a balance transfer according to the invention.

DETAILED DESCRIPTION OF THE INVENTION

The invention can be applied to any telecommunication network for billing management of telecommunication services in the network or value-added services (of separate service providers) provided through the network.

In the following, a subscriber who has a right to carry out an accounting facility (operating right) is called a host subscriber, master subscriber or a higher-priority subscriber. A lower-priority subscriber refers to a subscriber who does not have all the rights of a higher-priority subscriber. The lower-priority subscriber has, for example, a right to receive money from the higher-priority subscriber but the lower-priority subscriber does not have a right to transfer money to the higher-priority subscriber. The lower-priority subscriber may also be called a balance-limited subscriber since he or she has a prepaid balance or a credit limit to limit the use of services. A facility, in turn, primarily refers to changing the balance/limit, i.e. increasing or decreasing the balance/limit, but it may also refer to any other billing-related transaction, such as transferring a bill or a billing right between different subscribers.

Figure 1 shows a mobile communication system PLMN (Public Land Mobile Network) including user-operated billing management according to the invention. Mobile stations MS1, MS2, MS3 and MS4 are connected to the PLMN over a radio path (or by another wireless interface) via base stations BS. The mobile stations communicate with another PLMN via a base station. Connections from the PLMN to other telecommunication networks, such as a

PSTN (Public Switched Telephone Network), ISDN (Integrated Services Digital Network), public data network, or the Internet (TCP/IP networks), can be established in a manner known per se. An example of the PLMN is a GSM. The precise structure and operation of the GSM network is not relevant to the invention, and as far as the GSM network is concerned, reference is made to the GSM standards issued by the European Telecommunications Standards Institute. It should be noted, however, that, in addition to mobile communication networks, the invention can be applied to other telecommunication networks as well.

In the example of Figure 1, information on subscriber billing accounts is located in a billing database 10 managed by a PLMN operator. The invention can also be applied to billing service providers, for example, which can be located in a separate database. In the present application, the term 'billing database' should be understood to generally refer to any unit, facility or application which maintains real-time subscriber billing information, such as a prepaid balance or accumulated credit balance. A billing account refers to any information structure which comprises at least balance information or other such information.

Figure 2 shows an example of a structure of a billing database. Figure 2 only shows information structures that are relevant to the understanding of the invention, but the database can, of course, comprise a great amount of different information for a large number of subscribers. Figure 2 shows two billing subscriber groups G1 and G2. The first group G1 comprises subscriber identifiers of mobile stations MS1, MS2 and MS3, priorities 1, 4 and 2 set for the identifiers, and the subscribers' prepaid balances and potential account credit limits. The second group G2 comprises subscriber identifiers of mobile stations MS4, MS5 and MS6, priorities 4, 4 and 1 set for the identifiers, and the prepaid balances and potential account credit limits. Although the prepaid balance of the subscriber of the mobile station MS6 is -300 units, he or she can still use 700 units during a given billing period, for example, since he or she has 1000 units of credit in his or her account. The credit limit of a lower-priority subscriber can also be obtained from the balance of the master subscriber since the master subscriber has a right to transfer a sum corresponding to the sum between the account credit limit of the master subscriber and the prepaid balance to the lower-priority subscriber.

In Figure 2, the highest priority is priority 1 and the lowest priority is priority 4. A subscriber whose identifier has a higher priority has a right to transfer money from his or her own account to the balances of all the subscribers with a lower priority than the subscriber at issue. The higher-priority subscriber also has a right to transfer money from the balance of the lower-priority subscriber. If a subscriber has no priority ("-"), the subscriber has no right to receive nor transfer money. In a typical situation, one subscriber has priority 1 (master subscriber) and others priority 4 (no right to transfer money). More than one of the members in a group can be set as a master subscriber, who has the right to transfer money. Hence, for example, both parents in a family can be master subscribers.

Figure 3 is a flow diagram illustrating a balance transfer according to the invention after subscriber information has been stored in a subscriber database, at least one subscriber group has been formed of the subscribers and priorities have been set for the members in the group.

In a first preferred embodiment of the invention, the master subscriber establishes a common facility call to a predetermined service number. The service number preferably comprises an interactive answering device to provide the subscriber with voice prompts. By following these prompts, the subscriber can carry out the facility. The subscriber may issue instructions by, for example, keying in certain codes (DTMF codes) on the keypad of his or her terminal or by giving speech instructions. The answering device is connected to the billing database so as to enable it to carry out the billing facilities desired by the subscriber.

At the beginning of the facility call, in step 3-4, it is checked whether or not the subscriber has a right to carry out the facility of the invention. The subscriber can be authenticated (identified) on the basis of, for example, the authentication of the connection used by the master subscriber (e.g. GSM network subscriber authentication), or by using another authentication procedure and/or separate identifier, such as a PIN identifier. When the subscriber is verified, the rights of the subscriber can be checked in the billing database and the subscriber can be allowed billing facilities accordingly.

If the subscriber has the right to carry out the facility, i.e. the subscriber is a master subscriber in regard to at least one other subscriber in the same subscriber group, the process proceeds to step 3-6. In this step, the subscriber provides subscriber information on the subscriber to whom the fa-

cility is directed. In step 3-8, it is checked whether the destination of the facility belongs to the subscriber group, and if so, the process proceeds to the next step. In step 3-10, the master subscriber provides the amount of money to be transferred, i.e. the amount by which the balance of the destination of the facility is increased, and, in step 3-12, it is checked that the amount of money is large enough to cover, for example, more than one call made during the daytime but nevertheless not too large (e.g. many times the annual subscriptions of the subscriber) in order to avoid potential abuse. If the amount of money is of a correct size between, for example, 50 and 1000 monetary units, the process proceeds to step 3-14, where the facility is carried out, in other words, for example, money is transferred (for example, 100 monetary units are transferred from the prepaid balance of the subscriber MS1 to the prepaid balance of the subscriber MS3 in Figure 2) to a balance within the subscriber group. This means that in connection with a facility call, for example, the billing system of the telecommunication network automatically charges the master subscriber a sum according to the facility call of the master subscriber and the transferred balance, and the prepaid balance of the member of the prepaid group determined in the facility call is credited with a sum corresponding to the amount of said transferred balance.

If the subscriber has no right to carry out the facility and/or if the destination of the facility does not belong to the subscriber group and/or if the priority of the destination is higher than the priority of the performer of the facility and/or if the amount of money to be transferred is not of the correct size and/or if the account to be charged has too low a balance or credit, the facility will not be carried out. This can be indicated to the person trying to carry out the facility by using a short message, for example, which comprises a message "No right to transfer" or "No right to carry out the facility", for example.

The master subscriber may, in addition to the above-described changing of balance, make inquiries about the balance of the lower-priority subscriber, call itemization of the lower-priority subscriber or location of the lower-priority subscriber.

The balance transfer or another facility of the invention may also take place by means of a short message service. In such a case, the master subscriber communicates with a short message centre SMSC 11 through short messages. The master subscriber may, for example, provide, as a short message, pieces of relevant information to performing the facility requested by the

SMSC one piece at a time, and this information is transmitted to the SMSC. On the basis of this information, the subscriber may or may not be allowed to proceed to the next step. The short message centre SMSC 11 is connected to the billing database 10 to enable the desired billing facilities in the database 10 to be carried out.

An alternative is to arrange the facility call as an Internet connection, in which case the user interface is a WWW site. Through the interactive WWW site, the master subscriber can provide all relevant pieces of information, including the pieces of information inquired on the WWW pages, one at a time, the information being transmitted to the operator, and, in response to the information transmitted to the operator and the checking carried out by the operator, the facility required by the mobile station is either carried out or not. For example, the checks "Has the subscriber a right to carry out the facility?", "Does the destination of the facility belong to the group?" and "Is the amount of money to be transferred of the correct size?" can be carried out according to the flow diagram of Figure 3, for example.

In order to carry out the facility, the mobile station can establish a data connection to a gateway or a WAP (Wireless Application Protocol) gateway. The gateways, in turn, are connected to the Internet and/or an intranet. An Internet server of a public Internet service provider or a private Internet connection point, for example, may serve as a gateway. In both cases, the established connection may be any data or modem connection which is used for Internet connections.

In order for the mobile station to be able to communicate with the Internet, the mobile station is equipped with an Internet browser. The Internet browser may transmit requests to the gateway and receive and process the content of the WWW (World Wide Web) pages received from the gateway. The gateway forwards the requests received from the mobile station to the WWW server through the Internet according to the standard Internet protocols. The gateway thus serves as the transmitter of the requests on behalf of the user of the mobile station. In response to the request, the WWW server transmits the requested WWW pages to the gateway, which directs the WWW pages to the browser of the mobile station, which shows the retrieved WWW pages to the user on the display of the mobile station.

A terminal which enables the master subscriber to carry out the facility of the invention may be any terminal equipped with an Internet facility,

such as the mobile station above, a mobile station connected to a computer, data terminal equipped with a mobile communication facility, etc. The data connection between the terminal and the gateway may be a circuit- or packet-switched connection, virtual connection such as ATM (Asynchronous Transfer Mode), etc.

Another alternative for directing the facility request of the mobile station to the operator and carrying out the facility in response to the facility request is to use a terminal according to the WAP (Wireless Application Protocol) standard. The WAP specifies the application framework and network protocols for wireless equipment, such as mobile stations, paging devices and personal digital assistants. The specifications extend telecommunication technologies (e.g. digital network standards) and Internet technologies (e.g. XML, URL, various content formats). The WAP specifies a series of standard components that enable communication between terminals and WWW servers.

The content and applications of the WAP are specified in a series of known content formats based on known WWW content formats. The most common WAP content format is a WML (Wireless Markup Language), which is used for creating WAP pages. The WAP pages can be displayed by a WAP browser, e.g. by a microbrowser of a wireless terminal, which is an analogous standard for the WWW browser. The WAP content types and protocols are optimized for mass market and manually-operated devices.

When the mobile station establishes the data connection to the Internet through the WAP gateway, the WAP gateway provides a connection between the telecommunication network and the Internet WWW technology. The WAP gateway converts a WAP request to a WWW request and, at the same time, enables the WAP microbrowser in the mobile station to transmit requests to the WWW server. When the WAP connection is used for carrying out the facility of the invention, the content of the WWW pages can be created such that the use of the WAP and the content format WML of the WAP is taken into account by using, for example, the WML language on the WWW pages. In such a case, the mobile station is equipped with a WAP microbrowser. The data connection through the telecommunication network is similar to that described above.

It is obvious to one skilled in the art that as technology advances, the basic idea of the invention can be implemented in many different ways.

The invention and its embodiments are thus not restricted to the above-described examples but they can vary within the scope of the claims.

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CLAIMS

1. A method of billing subscribers in a telecommunication network, wherein each subscriber has billing accounts that are charged when services of the telecommunication network are used, **characterized** by

forming at least one subscriber billing group (G1, G2) comprising two or more subscribers (MS1...MS6), each subscriber having a billing account of his or her own in a billing database; and

determining at least one subscriber in the group (G1, G2) as a master subscriber (MS1), who has a right to access said billing database and carry out predetermined procedures in and between the accounts of the subscriber billing group.

2. A method as claimed in claim 1, **characterized** in that the master subscriber (MS1) has the right to access said billing database through said telecommunication network.

3. A method as claimed in claim 1, **characterized** in that the master subscriber (MS1) carries out balance transfers between the billing accounts within said group (G1, G2).

4. A method as claimed in any one of claims 1 to 3, **characterized** in that said billing account has a limited balance, and the master subscriber (MS1) changes the balance limit or balance of the billing account.

5. A method as claimed in claim 4, **characterized** in that said billing account is a prepayment account and/or an account equipped with a credit limit.

6. A method as claimed in claim 5, **characterized** in that the credit limit is obtained from the balance of the master subscriber.

7. A system wherein each subscriber has billing accounts in a billing database (10) that are charged when services of a telecommunication network are used, **characterized** in that

at least one subscriber billing group (G1, G2) comprising two or more subscribers (MS1...MS6) is formed in a subscriber database (2-2), each subscriber having a billing account of his or her own in the billing database (10), and at least one subscriber in the group is a master subscriber (MS1), who has a right to access said billing database (10) and carry out predetermined procedures in and between the accounts of the subscriber billing group, and in that

a telecommunication server is connected to the subscriber database (2-2) through which server the master subscriber (MS1) establishes a connection through said telecommunication network in order to carry out said facilities in the billing database (10).

8. A system as claimed in claim 7, **characterized** in that the master subscriber (MS1) has the right to access said billing database through said telecommunication network.

9. A system as claimed in claim 7 or 8, **characterized** in that said facilities comprise a balance transfer between the billing accounts within said group.

10. A system as claimed in any one of claims 7 to 9, **characterized** in that said billing account has a limited balance, and said facilities comprise changing the balance limit or balance of the billing account.

11. A system as claimed in claim 10, **characterized** in that said billing account is a prepayment account and/or an account equipped with a credit limit.

12. A system as claimed in claim 11, **characterized** in that the credit limit is obtained from the balance of the master subscriber.

13. A system as claimed in any one of claims 7 to 12, **characterized** in that the master subscriber (MS1) has access to said telecommunication service by making a facility call to a predetermined service number.

14. A system as claimed in claim 13, **characterized** in that said telecommunication server is an automatic answering apparatus.

15. A system as claimed in any one of claims 7 to 12, **characterized** in that said telecommunication server is a World Wide Web (WWW) server.

16. A system as claimed in any one of claims 7 to 12, **characterized** in that said telecommunication server is a Wireless Application Protocol (WAP) server.

17. A system as claimed in any one of claims 7 to 12, **characterized** in that said telecommunication server is a short message centre or a short message server.

ABSTRACT

The invention relates to a method of changing a balance of a subscriber (MS1...MS6) belonging to a subscriber group (G1, G2) of a telecommunication network. The invention comprises forming at least one subscriber group (G1, G2) comprising two or more subscribers (MS1...MS6), forming a prepaid balance for each subscriber (MS1...MS6), which prepaid balance is charged when services of the telecommunication network are used, and determining at least one subscriber (MS1...MS6) in the group as a master subscriber, who has a right to carry out money transfers (3-14) between the prepaid balances of the members (MS1...MS6) in the group.

(Figure 3)

Date Recue/Date Received 2020-06-15

FIG. 1

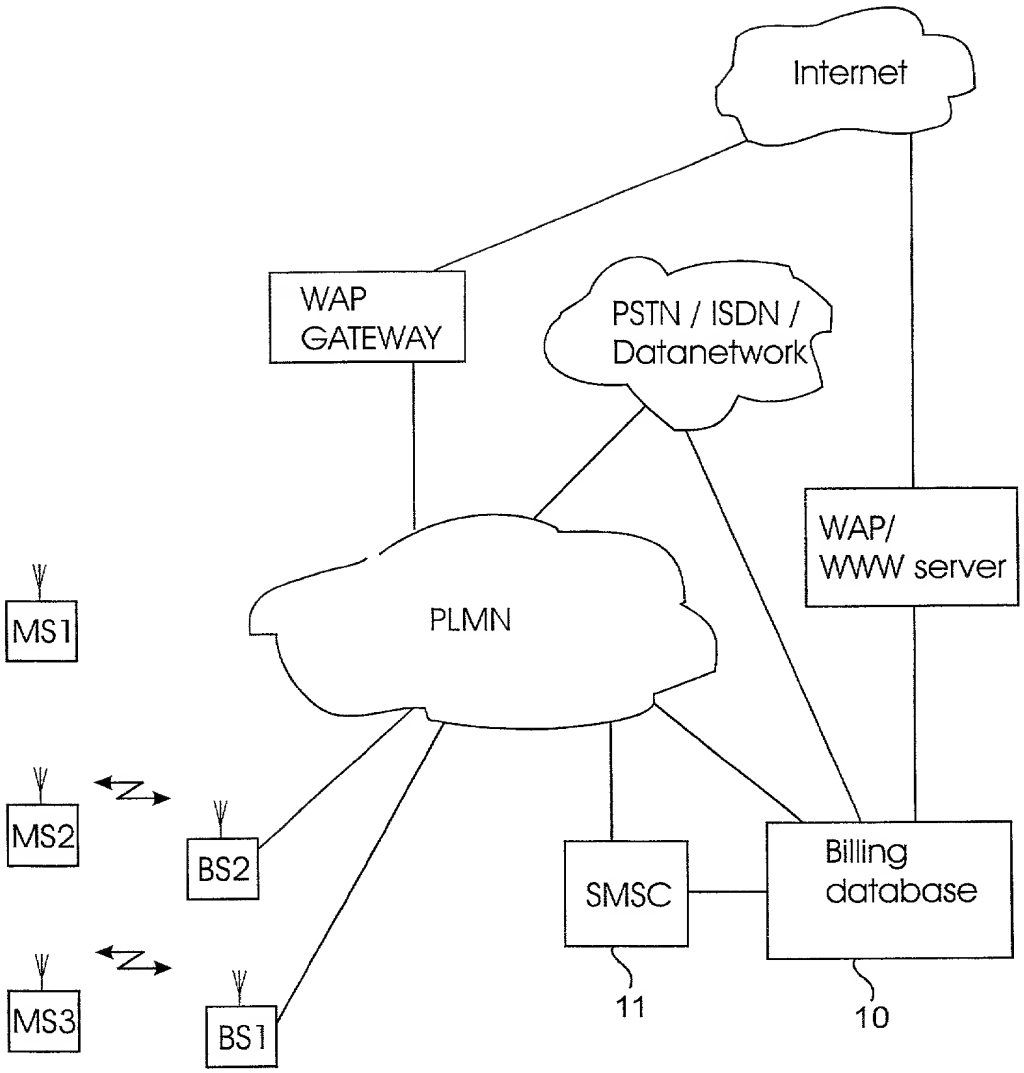
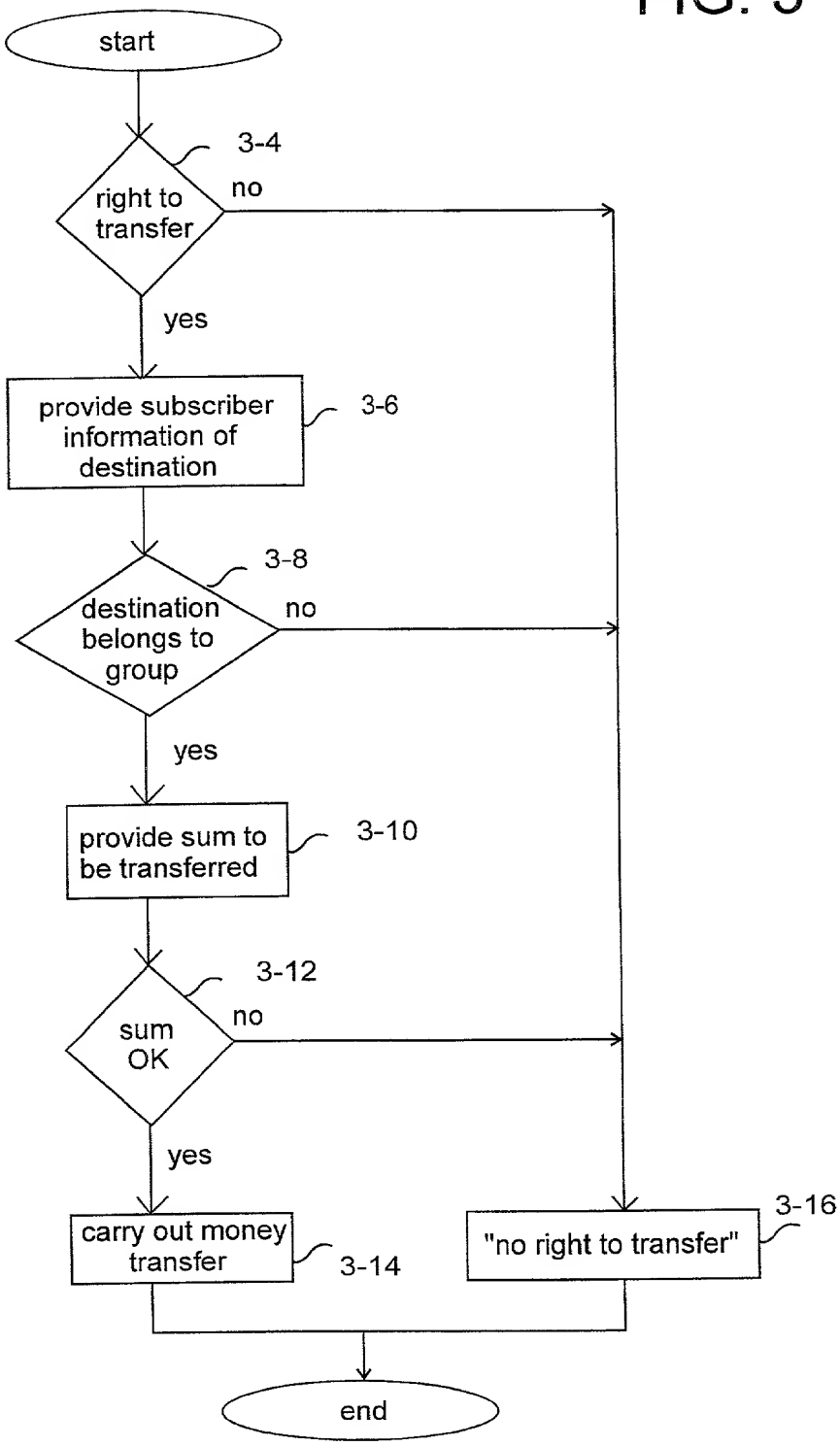

Internet
WAP
GATEWAY
PSTN / ISDN /
Datanetwork
WAP/
WWW server
PLMN
MS1
MS2
MS3
BS2
BS1
SMSC
Billing
database
11
10

FIG. 2

group	subscriber	priority	prepaid balance	account credit limit
G1	Ms1	1	1000	1000
G1	Ms2	4	200	-
G1	Ms3	2	100	-
G2	Ms4	4	100	-
G2	Ms5	4	200	-
G2	Ms6	1	-300	1000

FIG. 3


start
3-4
right to transfer
no
yes
provide subscriber information of destination
3-6
3-8
destination belongs to group
no
yes
provide sum to be transferred
3-10
3-12
sum OK
no
yes
carry out money transfer
3-14
"no right to transfer"
3-16
end

FOR UTILITY/DESIGN
CIP/PCT NATIONAL/PLANT
ORIGINAL/SUBSTITUTE/SUPPLEMENTAL
DECLARATIONS

RULE 63 (37 C.F.R. 1.63) DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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FORM

As a below named inventor, I hereby declare that my residence, post office address and citizenship are as stated below next to my name, and I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the INVENTION ENTITLED

METHOD OF BILLING SUBSCRIBERS IN TELECOMMUNICATION NETWORK

the specification of which (CHECK applicable BOX(ES))

X BOX(ES)
→ A. ☐ is attached hereto.
→ B. ☐ was filed on _____ as U.S. Application No. _____ / _____
→ C. ☒ was filed as PCT International Application No. PCT/ FI00 /00653 on 18 July 2000

and (if applicable to U.S. or PCT application) was amended on _____

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above. I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56. I hereby claim foreign priority benefits under 35 U.S.C. 119(a)-(d) or 365(b) of any foreign application(s) for patent or inventor's certificate, or 365(a) of any PCT International Application which designated at least one other country than the United States, listed below and have also identified below any foreign application for patent or inventor's certificate, or PCT International Application, filed by me or my assignee disclosing the subject matter claimed in this application and having a filing date (1) before that of the application on which priority is claimed, or (2) if no priority claimed, before the filing date of this application:

PRIOR FOREIGN APPLICATION(S) Number	Country	Day/MONTH/Year Filed	Date first Laid-open or Published	Date Patented or Granted	Priority Claimed Yes	No
991624	Finland	19 July 1999			X	

I hereby claim domestic priority benefit under 35 U.S.C. 119(e) or 120 and 365(c) of the indicated United States applications listed below and PCT international applications listed above or below and, if this is a continuation-in-part (CIP) application, insofar as the subject matter disclosed and claimed in this application is in addition to that disclosed in such prior applications, I acknowledge the duty to disclose all information known to me to be material to patentability as defined in 37 C.F.R. 1.56 which became available between the filing date of each such prior application and the national or PCT international filing date of this application:

PRIOR U.S. PROVISIONAL, NONPROVISIONAL AND/OR PCT APPLICATION(S) Application No. (series code/serial no.)	Day/MONTH/Year Filed	Status pending, abandoned, patented	Priority Claimed Yes	No

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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And I hereby appoint Pillsbury Madison & Sutro LLP, Intellectual Property Group, 1100 New York Avenue, N.W., Ninth Floor, East Tower, Washington, D.C. 20005-3918, telephone number (202) 861-3000 (to whom all communications are to be directed), and the below-named persons (of the same address) individually and collectively my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith and with the resulting patent, and I hereby authorize them to delete names/numbers below of persons no longer with their firm and to act and rely on instructions from and communicate directly with the person/assignee/attorney/firm/ organization who/which first sends/sent this case to them and by whom/which I hereby declare that I have consented after full disclosure to be represented unless/until I instruct the above Firm and/or a below attorney in writing to the contrary.

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